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Aquatic Insect Survey: Goldstein Open Space and Walking Path

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Aquatic Insect Survey

Goldstein Open Space & Walking Path

Randolph, MA



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Macro Invertebrate Sampling

- Left- India Santos
- Middle- Vicki Trinh
- Right Joseph Hubacheck



Recording Physical Habitat

Jasmin Wilson



- Site Sketch
- Weather Conditions
- Dominate Vegetations
- Overhead Canopy

- Water quality is the term that relates to not only the physical and chemical conditions of the water, but also how it is impacted by human activities and natural processes.

Water Quality



Why Monitor Water Quality?

- Monitoring water quality gives a good indication as to how healthy the ecosystem is and how it is impacted by human activities.
- The quality of the water determines what organisms one will find there.

Taking Samples

- Students collected both water and bug samples that were later studied in class.



What Does the Macro invertebrate Study Indicate?

- Species Richness
- Species Density



Site Description

Norroway Stream

David M. Goldstein Open Area
Randolph Massachusetts

Norroway Stream

Location:

- Randolph



- Located between West and Grove St.



Historical Perspective

- Walking path developed in the 1970's .
After Gibson family moved out.
- 40 acres of land



Weather

- Partly Cloudy
- High 62 Low 31
- 0 inches precipitation



Vegetation

1. Oaks (mostly black and white)
2. Maples (mostly red)
3. Blueberry Bushes
4. American Chestnuts
5. Sassafras



Water Conditions

- Fast flowing
- Murky
- Cold



Noroway Stream

- Looked for a location with a gravel bottom and both slow and fast moving water

**Our first sample was taken
from slow moving water.**



**Our second sample was taken
from fast moving water.**



Equipment:

- Hip Waders
- Collecting net
- Arm length rubber gloves
- Nylon-bristle brush
- Labeling tape, labels, pencils
- Tape measure
- Data field sheets
- Ethanol
- Sieve





**We proceeded into the water
to begin our sampling.**

Sampling procedure

- **One person held the net less than a foot above the bed of the river.**
- **Two other people shook up the sediment while picking up rocks and brushing them in order to collect organisms.**



- **After each time we collected organisms from both slow and fast moving waters, we transported the bugs from the net to the bucket.**
- **From there, we used a sieve to extract bugs from the bucket.**
- **We then preserved the bugs collected from the sieve in a jar with ethanol alcohol.**



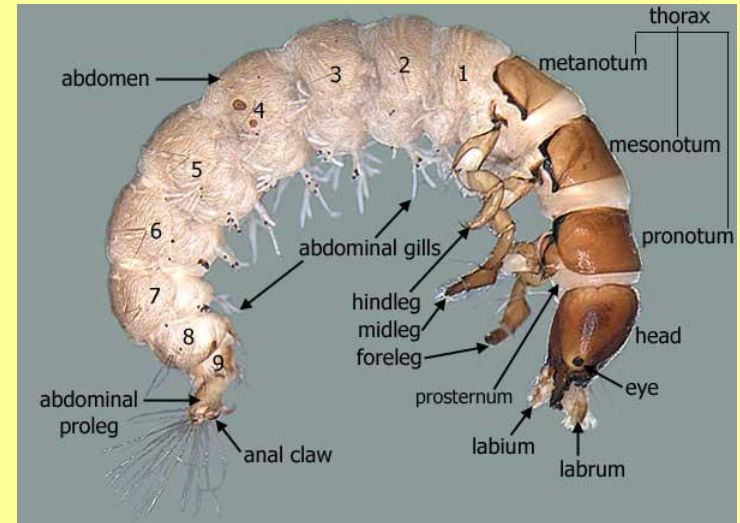
Sorting Procedure

- We deposited the bugs into a tray with a 12 box grid drawn on the bottom and covered the sample with water.
- Then, we randomly selected three of the twelve boxes from the grid to pick through. The contents of these grids were removed to a Petri dish.
- The contents of the dish were sorted and all the invertebrates were picked out and stored in alcohol.

- **Invertebrates were sorted, grouping the same types together.**
- **They were counted to make sure we had 200 bugs.**
- **A level one identification was done to the order level.**
- **Each order was totaled.**

Trichoptera

- Adults are mostly nocturnal.
- They hide in cool, moist environments.
 - Vegetation along river banks.
- Body and wings are clothed in long silky hairs.
- Hairs are called setae.
- Larvae serve as food for fish and other aquatic vertebrates.
- Easier to identify the species by the structure of the case than by the features of the body itself.



Diptera: Chironomidae

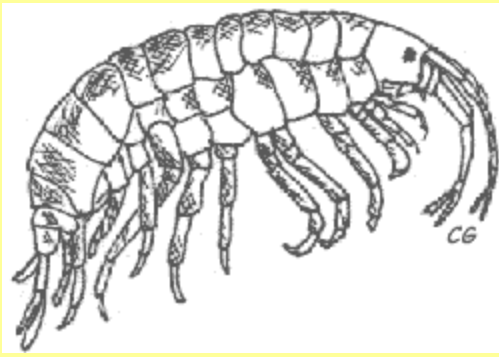
- Account for most micro invertebrates in freshwater environments.
- Larvae usually have anterior and posterior pairs of pro-legs.
- Often called “non- biting midges”
- Some are red colored so they are called “blood worm”
- Four life stages:
 - Egg
 - Larva
 - Pupa
 - Adult



Diptera: Other

- It may take up to one year for some species to complete their life cycles if they live in colder regions.
- In tropical habitats, life cycles may be as short as a few weeks.
- Tend to feed on detritus and other small animals and plants.
- Most adults do not feed.
- Certain families are able to withstand a pH value of 2.3 while others can stand electroplating wastes and crude oil.





Amphipoba

- Range in size from 1 to 340 millimeters.
- Body is divided into 13 segments. Segments are can be grouped into three categories.
 - Head
 - Thorax
 - Abdomen.
- Eggs are hatched into a juvenile form directly so there are no larvae.



Bug Data

Date Sampled: March 18, 2011

River or Stream: Norroway Stream, Randolph, MA

Type of Sample: 0.5m Kick

Collectors: India Santos, Joe Hubbacheck, Vicki Trinh

<u>Major Group</u>	<u>Count</u>	<u>Avg. Org. Density</u>	<u>Group %</u>	<u>Tot. X. Avg. Org. Density</u>
Trichoptera	1	4	0.30%	12
Diptera: Chironomidae	193	772	53%	5404
Diptera: Other	149	596	41%	2384
Amphipoda	21	84	6%	588
<u>Totals</u>	364	1456		8388
<u>MGBI:</u>	5.76			